SHRI MATA VAISHNO DEVI UNIVERSITY, KATRA
School of Civil Engineering
B. Tech.(3rd Sem) MajorExamination (Odd) 2019-20

Entry No: | | | | | | | | | | **Total Number of Pages:[02]**

Date: 06-12-2019 **Total Number of Questions: [05]**

CourseTitle:Concrete Technology
Course Code: CEL2022

Time Allowed: 3Hours **Max Marks: [50]**

Instructions

i. Attempt All Questions.
ii. Support your answer with neat freehand sketches/diagrams, wherever appropriate.
iii. Assume an appropriate data / information, wherever necessary / missing.

	Section - A		
Q1.	(a) Define initial and final setting time of cement.	[03]	CO1
	(b) Define accelerators and its application.	[03]	CO2
	(c) Briefly explain about vacuum concrete.	[03]	CO4
	(d) Draw the stress strain curve for concrete withexplanation.	[03]	CO3
	(e) Write a brief note on shotcrete.	[03]	CO4
	Section - B		
Q2.	Design concrete mix of M40 Grade using material characteristics with cement of specific gravity 3.15, specific gravity of fine and coarse aggregates 2.74, water absorption of fine and coarse aggregates 1% and 0.5% respectively. The nominal maximum size of coarse aggregates is 20 mm, minimum cement content 320 kg/m^3, maximum w/c ratio 0.45, exposure condition is severe (for reinforced concrete), method of concrete placing is pumping, chemical admixture type used is superplasticizer, sand of zone I. Refer table 1 and table 2 for mix design which is mentioned at the end of question paper.	[06]	CO3
Q3.	(a) How metakaolin is obtained? Mention its characteristics and explain the effect of metakaolin on fresh and hardened properties of the concrete.	[05]	CO2
	(b) What are the reasons for the occurrence of unsoundness in cement? Explain the test used to assess the unsoundness of cement.	[05]	CO1
Q4.	(a) What is segregation? Discuss the causes for its occurrence. Mention the remedial measures to be adopted to avoid segregation.	[05]	CO3
	(b) Describethe causes for corrosion of steel in concrete. Explain the mechanism of corrosion due to chloride attack.	[05]	CO3
Q5.	(a) Describe fibre reinforced concrete and its application. Explain the factors affecting the properties of fibre reinforced concrete.	[06]	CO4
	(b) Write a short note on Ferrocement.	[03]	CO4

Course Outcomes

CO1. Know various requirements of cement, aggregates and water for making concrete

CO2. Understand the effect of admixtures on properties of concrete.

CO3. Know the concept and procedure of mix design as per IS method and properties of concrete at fresh and hardened state.

CO4. Understand the various types of special concrete.

CO	Questions Mapping	Total Marks	Total Number of Students (to be appeared in Exam)
CO1	1 (a), 3(b)	8	59
CO2	1 (b), 3(a)	8	59
CO3	1(d), 2, 4	19	59
CO4	1(c), 1(e), 5	15	59

Table 1

Sl No.	Nominal Maximum Size of Aggregate	Maximum Water Content [1]
	mm	kg
(1)	(2)	(3)
i)	10	208
ii)	20	186
iii)	40	165

Table 2

Sl No.	Nominal Maximum Size of Aggregate	Volume of Coarse Aggregate[1] per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate			
	mm	Zone IV	Zone III	Zone II	Zone I
(1)	(2)	(3)	(4)	(5)	(6)
i)	10	0.50	0.48	0.46	0.44
ii)	20	0.66	0.64	0.62	0.60
iii)	40	0.75	0.73	0.71	0.69

[1] Volumes are based on aggregates in saturated surface dry condition.